CLAIMS

What is claimed is:

1. A semiconductor structure comprising a copper member located within a semiconductor device; a germanium-containing layer of at least one member selected from the group consisting of copper germanide, germanium oxide, germanium nitride and combinations thereof, located on at least one surface of the copper member; and a layer of a material poorly adherent to copper located on the germanium-containing layer.

2. The semiconductor structure of claim 1 wherein the copper member is copper or a copper alloy.

3. The semiconductor structure of claim 1 wherein the germanium-containing layer comprises copper germanide.

4. The semiconductor structure of claim 1 wherein the germanium-containing layer comprises germanium oxide.

5. The semiconductor structure of claim 1 wherein the germanium-containing layer comprises germanium nitride.

6. The semiconductor structure of claim 1 wherein the germanium-containing layer comprises a layer of copper germanide and a layer of germanium oxide.

7. The semiconductor structure of claim 1 wherein the germanium-containing layer contains a layer of copper germanide and a layer of germanium nitride.

8. The semiconductor structure of claim 1 wherein the germanium-containing layer contains a layer of copper germanide, a layer of germanium oxide and a layer of germanium nitride.

9. The semiconductor structure of claim 1 wherein the germanium-containing layer has a thickness of about 100 to about 1000 Å.

10. The semiconductor structure of claim 1 wherein the germanium-containing layer has a thickness of about 150 to about 400 Å.

11. The semiconductor structure of claim 9 wherein the copper has thickness of about 1000 to about 20,000 Å.

12. The semiconductor structure of claim 9 wherein the layer of material poorly adherent to copper has a thickness of about 100 to about 20000 Å.

13. The semiconductor structure of claim 1 wherein the material poorly adherent to copper is silicon nitride.

14. The semiconductor structure of claim 1 wherein the material poorly adherent to copper is silicon dioxide.

15. A process for fabricating a semiconductor structure which comprises the steps of providing a germanium-containing layer of at least one member selected from the group consisting of copper germanide, germanium oxide, germanium nitride and combinations thereof onto at least one surface of a copper member; and providing a layer

of a material that does not adhere well to copper on the germanium-containing layer.

16. The process of claim 15 which comprises providing a germanium-containing layer by selectively forming copper germanide on the copper member by flowing germane over the structure.

17. The process of claim 16 wherein the germane is at a temperature of about 200 to about 450°C.

18. The process of claim 16 which comprises providing a gaseous composition containing about 0.05 to about 5% of germane and a second gas selected from the group consisting of nitrogen, helium, argon, and mixtures thereof.

19. The process of claim 15 wherein the germanium-containing layer is provided by providing a layer of copper germanide on the copper and then oxidizing all or a portion of the copper germanide to provide a layer of germanium oxide.

20. The process of claim 15 wherein the thickness of the germanium-containing layer is about 100 to about 1000 Å.

21. The process of claim 15 wherein the thickness of the germanium-containing layer is about 150 to about 400 Å.

22. The process of claim 19 wherein the layer of copper germanide is about 100 to about 1000 Å and the layer of germanium oxide is about 100 to about 1000 Å.

23. The process of claim 15 wherein the germanium-containing layer comprises providing a layer of copper germanide and then nitriding all or a portion of the copper germanide layer to provide germanium nitride.

24. The process of claim 23 wherein the copper germanide layer is about 100 to about 1000 Å thick and the germanium nitride layer is about 100 to about 1000 Å thick.

25. The process of claim 15 wherein the germanium-containing layer is provided by providing a layer of copper germanide on the copper, then oxidizing all or a portion of the copper germanide to provide a layer of germanium oxide, and then nitriding a portion of the copper oxide layer to provide germanium nitride.

26. The process of claim 15 wherein the copper member is copper or a copper alloy.

27. The process of claim 15 wherein the copper member is about 1000 to about 20,000 Å thick.

28. The process of claim 15 wherein the layer of silicon nitride is about 100 to about 20000 Å thick.

29. The process of claim 15 wherein the material that does not adhere well to copper is silicon nitride.

30. The process of claim 15 wherein the material that does not adhere well to copper is silicon dioxide.

31. A semiconductor structure obtained by the process of claim 15.